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EXAMINER	
ROSALES HANNER, MORELLA I	

ART UNIT	PAPER NUMBER
2128	4

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/659,948	Applicant(s) ANTONY, RICHARD T.	
	Examiner Morella I Rosales-Hanner	Art Unit 2128	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on *12 September 2000*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☑ Claim(s) 1-20 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

1. Claims **1 – 20** are pending and have been examined.

Priority

2. The Office acknowledges Applicant's priority date from application number **60/153,369** filed on **September 13, 1999**.

Information Disclosure Statement

3. The reason for incorporation by reference practice with respect to applications, which are to issue as U.S. patents, is to provide the public with a patent disclosure that minimizes the public's burden to search for and obtain copies of documents incorporated by reference that may not be readily available. Therefore, the Applicant is requested to furnish the Office with a copy of the following essential materials:

a) "*Spatial Reasoning and Knowledge Representation, Geographic Information Systems in the Government Workshop Proceedings*" A. Deepak Publishing (1986) **[Pg 5, 14]**; **and**

b) Antony Treatise, supra at 95 **[Pg 8, line 9]**

together with the corresponding Form PTO-1449. Please refer to MPEP § 608.01(p).

It is noted that the ***"Principles of Data Fusion Automation"*** reference from the above list is particular relevant to the claimed invention and was not disclosed with the application. The book has been independently obtained by the Office. A patent by its very nature is affected with a public interest. The public interest is best served, and the most effective patent examination occurs when, at the time an application is being

examined, the Office is aware of and evaluates the teachings of all information material to patentability. As per 37 CFR 1.56, each individual associated with the filing and prosecution of a patent application has a duty of candor and good faith in dealing with the Office, which includes a duty to disclose to the Office all information known to that individual to be material to patentability as defined in Chapter 2000 of the MPEP.

Drawings

3. **Figures 1- 3, 4(a) – 4 (f), 5, 7, 19, 21 - 24, 28, and 30** are objected to under 37 CFR 1.83. A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

3.1 As regards to **Figures 1- 3, 4(a) – 4 (f), 5, and 7** these drawings should be designated by a legend such as – **Prior Art** – because by applicant's own admission [Pg 8] only that is already known in the art is illustrated. Please refer to **MPEP § 608.02(g)**.

3.2 As regards to **Figures 19, 21 - 24, 28, and 30,** these drawings are objected to because part of the drawing is not completely legible. For example, the upper left corner of Figure 19 contains characters after the phase 'Intersection products outlined in gray; union…' that are assumed to recite in '**black**'.

Specification

4. The disclosure is objected to because of the following informalities:

On page 15 at line 3, the sentence "...**the position of entry and exit of each of each**..." appears to be grammatically incorrect. This sentence appears to contain an extra '**of each**'. Appropriate correction is required.

5. The attempt to incorporate subject matter into this application by referencing to the following publications:

- *"Principles of Data Fusion Automation"* (Artech House 1995) by R. Antony **[Pg 8, line 2]**;
- "*Spatial Reasoning and Knowledge Representation, Geographic Information Systems in the Government Workshop Proceedings"* A. Deepak Publishing (1986) **[Pg 5, 14]**; and
- Antony Treatise, supra at 95 **[Pg 8, line 9]**

is improper because by Applicant's own admission **[Pgs 8, 10, and 13]** the information contained in these references is deemed essential matter.

Claim Rejections - 35 USC § 101

6. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

6.1 Claims 1 – 20 are rejected under 35 U.S.C. 101 because the language of the claims raises a question as to whether the claims are directed merely to an abstract idea that is not tied to a technological art, environment or machine which would result in a practical application producing a concrete, useful, and tangible result to form the basis

of statutory subject matter under 35 U.S.C. 101. It is noted that Applicant alleges that the present invention is an improvement over existing algorithms [**Pg 35, third full paragraph of specification**].

7. Claim Rejections - 35 USC § 112

7.1 The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

7.1.1 Claims **1 – 20** are rejected under 35 U.S.C. 112, first paragraph, as based on a disclosure which is not enabling. For claim 6 recites calculating an overall vector-based set operation by performing a set operation separately on the *interior x interior* and *boundary x interior* indexing and combining the results with the *boundary x boundary* indexing cell product. Therefore, the *interior x interior* indexing cells set operation and the *boundary x interior* indexing cells set operation generation process is essential to the practice of the invention, but not included in the claims is not enabled by the disclosure. See *In re Mayhew*, 527 F.2d 1229, 188 USPQ 356 (CCPA 1976). Applicant discloses [**Pg 8 of specification**] that set operation generation is treated as a three-stage process involving three canonical form classes (*Class 1: interaction between two interior cells, Class 2: interaction between a boundary and an interior cell, and Class 3: interaction between two boundary cells*). Applicant admits that the appropriate methods for generating the products from Class 1 and Class 2 are described in the '*Antony treatise, supra at 95*' reference and that the instant application focuses on Class 3

7.2 The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7.2.1 **Claims 1 – 6, 9 – 19** are rejected under U.S.C. 112, second paragraph, for the following reason: the claims recite the phrases '**boundary x boundary**' and/or '**interior x interior**' and fails to indicate the meaning of the '**x**' character. This character could have different connotations such as matrix operator, cross multiplier, etc,. **Claims 7, 8 and 20** depend on one of the rejected claims and therefore are also rejected. Applicant is required to amend accordingly or take other appropriate steps to correct these deficiencies.

7.2.2 **Claims 1 – 8 and 13 – 20** are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential steps, such omission amounting to a gap between the steps. See MPEP § 2172.01. The preamble of claims 1, 13 and 17 recite a method for computing Boolean set operations but the claims fail to recite the step pertaining to computing Boolean set operations. Claims 2 – 8, 14 – 16, and 18 –20 depend on one of the rejected claims and therefore are also rejected. Applicant is required to amend accordingly or take other appropriate steps to correct these deficiencies.

7.2.3 **Claims 9 - 12** are rejected under 35 U.S.C. 112, second paragraph, for the following reason: the term "**optimal**" in line 1 of claim 9 is a relative term, which renders the claim indefinite. The term "optimal" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the

invention. **Claims 10 -12** depend on claim 9 and therefore are also rejected. Applicant is required to amend accordingly or take other appropriate steps to correct these deficiencies.

Claim interpretation

8. The **claims 1, 13, and 17** appear to be in a **Jepson-type** structure in so far as:

a) Applicant have not invented computing Boolean set operations on two regions defined by quadtree-indexed vector representations of region boundary tuples,

b) the recitation occurs in the preamble, and

c) Applicant has admitted [**Pg 8 of specification**] that the categorical approach for analysis set operations was developed and partially available more than one year prior to the priority date of the instant application.

For example, **claim 1** [**line 2**] recites: " A method for computing Boolean set operations on two regions defined by quadtree-indexed vector representations of region boundary tuples, **comprising** ..."

It is impliedly admitted that a method for computing Boolean set operations on the regions defined by quadtree-indexed vector representations of region boundary tuples is considered to be old in the art. Furthermore, by Applicant's own admission [**Pg 13, paragraph 3**] two of the steps are already known in the art. In re Ehrreich, 590 F.2d 902, 909-910 200 USPQ 504, 510 (CCPA 1979) (emphasis in original) (citations omitted). See also Sjolund v. Musland, 847 F.2d 1573, 1577, 6 USPQ2d 2020, 2023 (Fed. Cir. 1988); Pentec, Inc. v. Graphic Controls Corp., 776 F.2d 309, 315, 227 USPQ 766, 770 (Fed. Cir.1985); and Reading & Bates Construction Co. v. Baker Energy Resources

Corp., 748 F.2d 645, 650, 223 USPQ 1168, 1172 (Fed. Cir. 1984). Claims must be read in light of the specification. Where the specification confirms that another before applicants' invention invented the subject matter of the preamble, the preamble is treated as prior art.

9. Claim Rejections - 35 USC § 102

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

9.1 **Claims 1 – 20** are rejected under 35 U.S.C. 102(b) as being clearly anticipated by a printed publication by Richard T. Antony titled **"Principles of Data Fusion Automation"** hereafter referred to as *Antony*. **Claims 1 – 20** are drawn to a method for computing Boolean set operations on two regions defined by quadtree-indexed vector representation comprising the steps of:

- classifying quadtree indexing cells for each region as either interior indexing cells or boundary indexing cells;
- categorizing quadtree indexing cells that interact between the two regions as interior x interior, boundary x interior, or boundary x boundary;
- defining pseudo points for each boundary x boundary indexing cells;
- categorizing each Boundary x Boundary indexing cell based on a relationship of said pseudo points, and selecting one of the two regions to be a starting region based on the categorization;
- calculating a set operation by forming a list of tuples in each Boundary x Boundary indexing cell encountered while tracing the starting region until it

intersects with the other region and then accumulating tuples encountered while tracing the other region.

The *Antony* reference teaches [**Chapters 8, section 8.4.4, first paragraph**] a method, consisting of a **quadtree-based** spatial **indexed vector-based representation** that supports straightforward search, association, and set operations among **region** features, and comprising the steps of:

- implementing a hybrid region representation that classifies quadtree indexing nodes (cells) for a region as either **interior** or **boundary**;
- generating (categorizing) quadtree indexing nodes (cells) that interact between two regions [**Pg 271, Section 9.2.1**] as three classes of intersection products (x):
    1) region 1 interior nodes x region 2 interior nodes (interior x interior),
    2) region 1 boundary nodes x region 2 interior nodes (boundary x interior), and
    3) region 1 boundary nodes x region 2 boundary nodes (boundary x boundary);
- defining (pseudo) points for each boundary x boundary indexing node (cell) [**Pg 253, Hybrid Region Representation**];
- categorizing each exterior boundary (Boundary x Boundary) indexing node (cell) based on a relationship of said pseudo points, and selecting one of the two regions to be a starting region based on the categorization[**Pg 253, Hybrid Region Representation**];

- pre-testing that the two regions interact by some degree to ensure that the vector-based set operation is not a null solution[**Pg 239, Section Areal-Based Boolean Set Operations**]; and
- calculating a set operation by forming a list of **tuples** in each Boundary x Boundary indexing nodes encountered while tracing the starting region until it intersects with the other region and then accumulating tuples encountered while tracing the other region [**Pg 253, Hybrid Region Representation**].

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

10.1 Claims 1 - 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over **U.S. Patent No. 5,649,084** issued to Peter Ernst, hereafter referred to as *Ernst* in view of **U.S. Patent No. 5,818,460** issued to Covey et al., hereafter referred to as *Covey* in view of a printed publication by Richard Antony (applicant) titled "Principle of Data Fusion Automation" hereafter referred to as Antony , in further view of Applicant's own admission.

10.1.1 The claims are drawn to a method for computing Boolean set operations on two regions defined by quadtree-indexed vector representation comprising the steps of:

- classifying quadtree indexing cells for each region as either interior indexing cells or boundary indexing cells;
- pre-testing that two regions interact by some degree to ensure that the vector-based set operation is not a null solution;
- categorizing quadtree indexing cells that interact between the two regions as interior x interior, boundary x interior, or boundary x boundary;
- defining pseudo points for each boundary x boundary indexing cells;
- categorizing each Boundary x Boundary indexing cell based on a relationship of said pseudo points, and selecting one of the two regions to be a starting region based on the categorization;
- calculating a set operation by forming a list of tuples in each Boundary x Boundary indexing cell encountered while tracing the starting region until it intersects with the other region and then accumulating tuples encountered while tracing the other region.

Ernst teaches **[Fig 11a & Fig 11b and accompanied text]** a method for performing Boolean operations on geometric objects comprising the steps of:

- identifying areas of each geometric object as surface (interior) and curve (boundary);
- checking if any intersection tracks between two surfaces (regions) exist to ensure that intersection of the two regions is not null;

- defining surface/surface intersections (interior x interior), curve/surface intersections (boundary x interior) or curve/curve intersections (boundary x boundary) between two surfaces (regions);
- defining relocated intersection points (pseudo points) for each curve/curve (boundary x boundary) intersection;
- categorizing curve/curve (boundary x boundary) intersection based on the ordering (relationship) of relocated intersection (pseudo) points;
- calculating intersection tracks (set operation) ordered in increasing parameter order (tuple points) to complete intersection tracks; and
- performing a set operation by forming point clusters (tuple) based on curve/curve intersection points.

Ernst does not expressly teach the use of quadtree-indexed vector representation to perform Boolean set operations on the two regions or completing a Boolean set operation by collecting tuple points along a starting region boundary until it intersects the other region and then accumulating tuple points along the other region boundary and repeating the process until the respective boundary x boundary cells have been traversed.

Covey teaches **[Col 1, lines 46 – 62]** a method for performing a polygon set operation on two or more polygons (regions) comprising determining a trace direction based on the set operation and all intersection points between the regions; selecting an initial intersection point between the two polygons (regions); tracing (accumulating tuple points) the perimeter (boundary) of the selected region;

switching between the perimeter as additional intersection points are reached during the tracing; and finishing the process when the original intersection point is reached during the tracing. Covey also teaches [**Col 2, lines 43 – 45**] that this method allows for simpler data structures while eliminating undesirable degenerate edges produced by other methods.

Antony teaches [**Chapter 8, section 8.3**] the use of quadtree data structure to perform Boolean set operations on two regions. *Antony* further teaches [section 8.3.3] important properties of using quadtree representation such as: relatively compact representation of 2-dimensional regions, efficient set operation support, and simple transformation, scaling and rotation operations handling.

It would have been obvious to one of ordinary skills in the art, at the time of the invention to implement the method, for computing Boolean set operations on two regions, as taught by *Ernst* using a quadtree data structure, as taught by *Antony*, in the fashion taught by *Covey* to obtain a relatively compact representation of two-dimensional regions and that facilitates efficient set operations while eliminating undesirable edge degeneration.

Finally, it is noted that Applicant has admitted [**Pg 8 of specification**] that the categorical approach for analysis set operations was developed and partially available more than one year prior to the priority date of the instant application and have admitted that a method for computing Boolean set operations on the regions defined by quadtree-indexed vector representations of region boundary tuples is considered to be old in the art.

As per calculating an overall vector-based set operation by performing a set operation (union and intersection) separately on the interior x interior and boundary x interior cells, and combining the results with the boundary x boundary cell product.

Ernst teaches **[steps 61 – 80 of Fig 11 a – 11b and accompanied text]** performing a set operation like UNITE, SUBTRACT, or INTERSECT by identifying intersection points between: the surface (interior) of face1 (region 1) and the surface (interior) of face2 (region 2), the edge (boundary) of face1 (region 1) and the surface (interior) of face2, the edge (boundary) of face2 (region 2) and the surface (interior) of face1, and the boundary curve of face 1 and the boundary curve of face 2.

Ernst does not expressly teach calculating an overall vector-based set operation by combining (concatenating) the individual products.

Convey teaches **[Fig. 5A and accompanied text]** tracing (combining) all intersection points.

Antony teaches **[Chapter 9, section 9]** that the efficiency of the set operation evaluation process can be significantly affected by clause evaluation order and that based on this observation, intersections should begin with the smallest sized sets. *Antony* further teaches an overall vector-based set operation that combines (concatenates) the individual products starting with the smallest size sets products (interior x interior, boundary x interior) and ending with the largest size sets products (boundary x boundary).

Therefore, it would have been obvious to one of ordinary skills in the art, at the time of the invention, to perform set operation by first identifying all intersection points, as taught by *Ernst* and combining (concatenating) all intersection points, as taught by *Covey* starting with the smallest size sets and ending with the largest size set products as taught by *Antony* in order to improve the efficiency of the set operation.

Conclusion

11. The following prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

- US Patent No. 5,321,613 issued to Porter et al. on Jun.14 1994.
- US Patent No. 5,924,053 issued to Horowitz et al. on Jul 13, 1999 .
- US Patent No. 5,014,230, issued to Sinha et al. on May 7 1991.
- US Patent No. 5,963,670, issued to Lipson et al. on Oct. 5 1999.
- US Patent No. 5,724,451, issued to Shin et al. on Mar 3 1998.
- US Patent No. 5,901,245, issued to Warnick et al. on May 4 1999.
- US Patent No. 5,751,286, issued to Barber et al. on May 12, 1998.
- US Patent No. 6,148,295, issued to Megiddo et al. on Nov. 14, 2000.
- US Patent No. 6,292,797, issued to Tuzhilin et al. on Sep. 18, 2001.
- US Patent No. 6,466,696 , issued to Politis on Oct. 15 2002.
- US Patent No. 6,307,555, issued to Eugene T. Y. Lee on Oct 23, 2001.
- US Patent No. 5,353,395 , issued to Tokumasu et al. on Oct 4, 1994.

- B. Chazelle, D.P. Dobkin; "Intersection of Convex Objects in Two and Three Dimensions", Journal of the ACM, vol. 34, No. 1, Jan 1887, pp 1-27.
- You-Dong Liang, Brian A. Barsky, "Analysis and Algorithm for Polygon Clipping", Communications of the ACM, Vol 26, No. 11, Nov 1983, pp. 868 – 877
- Clodoveu A. Davis Jr., Alberto H. F. Laender, « Multiple Representations in GIS : Materialization Though Map Generation, Geometric, and Spatial Analysis Operations", ACM GIS '99. pp 60 – 65.
- Toshiaki Satoh, "Boolean Operations on Set Using Surface Data", 1991, ACM, pp 119 –127.
- D. Ayala, P. Brunet, R. Juan, I. Navazo, "Object Representation by Means of Nonminimal Division Quadtree and Octree", ACM Transactions on Graphics, Vol. 4, No. 1, Jan 1985, pp. 41 –59.
- Ingo Wegener, "The Size of Reduced OBDD's and Optimal Read-Once Branching Programs for Almost All Boolean Functions", IEEE, Vol 43, No. 11, Nov 1994, pp 1262 – 1269.
- Randal E. Bryant, "Symbolic Boolean Manipulation with Ordered Binary Decision Diagrams", July 1992
- Randal C. Nelson, Hanan Samet, "A Consistent Hierarchical Representation for Vector Data", ACM, Vol 20, No. 4, 1986.
- Charles R. Dyer, Azriel Rosenfeld, and Hanan Samet,"Region Representation:Boundary Codes from Quadtrees", Communications of the ACM, Vol 23, No. 3, Mar 1980, pp 171 – 179.

- Waldo Tobler and Zin-tan Chen, "A Quadtree For Global Information Storage", Geographical Analysis, 18,4 (Oct 1986), 360-371.
- Sabine Timpf and Andrew U. Frank, "Using Hierarchical Spatial Data Structures for Hierarchical Spatial Reasoning", 1997, Lecture Notes in Computer Science, pp 69 –83.
- James M. Sheng, Olivia R. Liu Sheng, "R-tree for Large Geographic Information Systems in a Multi-User Environment", IEEE 1990.
- Hanan Samet, Robert E. Webber, "Storing a Collection of Polygons Using Quadtrees", ACM Transactions on Graphics, Vol 4, No 3, Jul 19885, pp. 182 – 222.

Response Guidelines

12. A shortened statutory period for reply to this office action is set to expire **3 (three) months and 0 (zero) days** from the mailing date of this action. In the event a first reply is filed within **2 (two) months** of the mailing date of this action and the advisory action is not mailed until after the end of the **3 (three) months** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this action.

Any inquiry concerning this communication or earlier communication from the examiner should be directed to Morella Rosales-Hanner whose telephone number is (703) 305-8883. The examiner can normally be reached Monday-Friday from 7:00 a.m. to 3:30 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kevin Teska can be reached on 703 305-9704. The fax number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-3900.

MRH

April 14, 2004

HUGH JONES Ph.D.
PRIMARY PATENT EXAMINER
TECHNOLOGY CENTER 2100